

JP '813) in view of Inoue (U.S. Patent 5,775,407) or newly applied JP 58-122213 (hereinafter "the JP '213 reference"); (2) the rejection of claims 1 and 7 under Section 103(a) over the prior art in (1) above, further in view of German 35 14 359 (hereinafter "DE '359") or German 39 40 361 (hereinafter "DE '361"); (3) the rejection of claims 1 and 7 under Section 103(a) over DE '359 in view of JP '813; (4) the rejection of claims 4-6 and 12-14 under Section 103(a) over "the prior art applied to claim 1" and further in view of Otsuka (U.S. 3,881,546) and Logsdon (U.S. 3,967,779); (5) the rejection of claim 5 under Section 103(a) over "the prior art as applied to claim 1" and further in view of Sugawara et al. ("Sugawara") or Moore; (6) the rejection of claims 7, 9 and 11 under Section 103(a) over the "prior art as applied to claim 1" and further in view of Sarbach; and (7) the rejection of claims 1, 4-7, 9, 11, 13 and 14 under 35 U.S.C. § 112, first paragraph, as being based on a disclosure that allegedly lacks a written description of the recitation in the claims that the quantity of air fed to each of the four heating/air-conditioning zone is independently controllable. Reconsideration of these grounds of rejection is respectfully requested in light of the following remarks and the evidence submitted herewith.

The Section 112 Rejection

Applicants respectfully submit that the PTO is factually incorrect in its allegation that the originally filed application does not contain a "written description" of the claimed feature that the quantity of air fed to each of the four heating/air-conditioning zone is independently controllable. While this precise language is not used in the specification, this is not the test for written description. The entire written disclosure as well as the patent drawings must be considered to determine what is contained in the written description of the invention. In this instance, it is simply the way in which the preferred embodiment operates, i.e., to independently control the volume or quantity of air that is fed to each of the four independent zones.

Submitted with this response is a Declaration under Rule 132 by Hans Kampf, a person of ordinary skill in the heating/air-conditioning design art. He has worked for

Applicants' assignee in this capacity since 1981. In paragraph 3 of his Declaration, Mr. Kampf outlines in detail the portions of the original disclosure of the present application that provide a written description of the claimed feature that the quantity of air fed to each of the four heating/air-conditioning zone is independently controllable, i.e.:

For example, the disclosure on pages 4-6 of the original application describes the preferred embodiment in detail. Beginning on line 15 of page 4, it states that "each of the four cold-air ducts then obtained opens out in each case into one mixing space (50, 52, 54, 56)." Beginning at line 32 of that page, it is stated that, if "each mixing space is assigned at least two of the air-stream control elements, of which one is provided as a cold-air flap in the cold-air duct and a second is designed as a warm-air control element arranged directly on the outlet side of the heater, it is possible for the cold-air stream and the warm-air stream to be regulated separately from one another." At lines 18-19 of page 5 it is also noted that "each mixing space can also be fed cold air in a separately adjustable manner." The following disclosure through page 6 makes it clear that the cold air ducts can be "closed off" (page 6, line 22) with air flaps 30 and 32, and also that the warm-air control elements, i.e., lamellae 44, in their closed position, "cover" (page 6, line 29) one of the respective sub-regions of the heater 18.

Mr. Kampf concludes as follows at the end of paragraph 3 of his Declaration:

With these two types of control for the quantity of cold air and heated air, that allow the air to flow or to be shut off, a person skilled in the art understands that the volume of air fed into each of the four zones can be controlled independently of the volume of air supplied to each the other zones. This feature is disclosed in the subject application, as it would be understood by a person of ordinary skill in the art, and as will be discussed below, represents an important and advantageous feature of the invention described in the application.

Since this is, in fact, the manner in which Applicants' described preferred embodiment operates, it cannot be "new matter" to recite this manner of operation in the claims. There can be no doubt that the Applicants were in possession of this aspect of their invention as of the filing date of this application, since this aspect represents the very mode of operation of the preferred embodiment that is described in detail in the specification and drawings. For these reasons, reconsideration and withdrawal of the stated rejection under Section 112 are respectfully requested.

Rejections Based on the Prior Art

Applicants believe that the PTO has based its rejections of the pending claims on (1) an incorrect factual premise as well as on (2) an incorrect application of the law, in that the PTO has impermissibly ignored some of the words in Applicants' claims, i.e., as will be discussed below, the law requires that all words, even those alleged to be unsupported by the specification, must be considered in making a determination under Section 103. Furthermore, Applicants respectfully submit that the PTO has improperly rejected the claims based on hindsight. For these reasons, reconsideration and withdrawal of the various rejections based on the prior art are requested.

At the outset, Applicants wish to clarify an apparent misunderstanding of a statement made in their previous response, inasmuch as it is important to have a clear record. Applicants' statement at the bottom of page 7 of Paper No. ¹⁸13 was apparently understood by the PTO as an argument that DE '359 was the only art of record that discloses a four-zone heating/air-conditioning system. However, this was clearly not the intention of the statement. Rather, the point was merely being made that DE '359 was the only one of the references relied upon by the PTO (to reject the claims) that related to a four-zone system. Indeed, as recognized on the previous page 4 of the Office Action, Applicants own specification in this case discussed other prior art that relates to four zone systems. Any ambiguity that may have led to the misunderstanding is regretted.

*paper No. 18
page 7,
lines 25-26*

The Incorrect Factual Premise

The Office Action evidences the fact that the rejections are based on a factual premise arrived at by the PTO, namely,

"It is submitted that what has changed in the automotive art in the last two decades is the size of automobiles. The average size car in 1998 is much smaller than the average size car in 1988. This has forced car makers to reduce the size of components. Smaller sizes are driving the automotive industry and its suppliers to look for smaller solutions to problems. In the luxury car market . . . where relatively expensive four-zone heating and cooling systems are, no doubt, to be first deployed, the need for compact packaging of the air-conditioner/heater was much greater at the time that this application was filed than in the past. It is respectfully submitted that

the age of the references and the obviousness or non-obviousness of their combination must be judged at the time the current invention was made not in a purely historical context.” (underlining supplied)

This factual premise is believed to be incorrect and, as such, cannot be employed to support the stated rejections. As set forth in the Declaration of Hans Kampf submitted herewith, the most significant downsizing of automobiles took place in the 1970's and the early 1980's, and the motivation for arriving at a compact four-zone heating/air-conditioning system was equally as strong in the mid-1980's, when the cited prior art references were published, as it was in 1997, when the priority application of the present application was filed. (Paragraphs 5 and 6) Indeed, the idea of a four-zone system with independent control of temperature and air volume in each of the zones is not new; however, in spite of essentially unchanged space considerations over the past 15-20 years, the industry has not implemented a compact and practical four-zone system capable of the desired independent control.

The PTO is also incorrect if it is implying that the “historical context” is not relevant to the consideration of patentability under Section 103. The long-felt need for a particular solution, coupled with a failure of those in the art to satisfy that need, has consistently been recognized by the courts as constituting strong evidence of patentable invention. This is one of the so-called secondary factors expressly mentioned by the Supreme Court in the landmark *Graham vs. John Deere* case.

As Mr. Ford well knows, the automotive heating/air-conditioning field is a fiercely competitive field, and at least insofar as the basic overall system design considerations are concerned, improvements are not made as bold leaps forward, but rather as relatively modest refinements in basic design. In those instances, such as the present invention, where those relatively modest changes in design result in demonstrative advantages in the practical marketplace, such innovations deserve to be recognized as patentable inventions.

The PTO has Impermissibly Ignored Claim Language

In the Office Action, the PTO has taken the position that “claimed subject matter not supported by the specification as originally filed” and arguments based thereon “are

of no moment.” (Page 4) This represents an incorrect procedure for determining the patentability under Section 103. According to the law, every word in a claim must be considered when making the determination under Section 103. This includes language in the claim that the PTO separately concludes is not supported by the specification. See, for example, *Ex parte Pearson*, 230 U.S.P.Q. 711 (Bd. App. 1986), citing the applicable precedent. See also, M.P.E.P. § 2143.03, which is directly on point.

Consequently, the PTO has not properly evaluated the patentability of claims 1, 4-7, 9, 11 and 13-14, all of which recite the language that was improperly ignored in reaching the stated conclusion of obviousness. Moreover, the PTO has not set forth any alternative basis for rejection of those claims that takes into consideration the improperly ignored language. On this basis alone, the stated grounds of rejection as to these claims should be withdrawn.

Of course, Applicants would also point out that, as demonstrated above with reference to the present specification and the evidence supplied by the Kampf Declaration, the language of the claims ignored by the PTO does, in fact, find support in the present specification as originally filed.

As the record stands, none of the systems disclosed in the prior art references cited in the foregoing rejections accomplishes either of the main advantages of the present invention, i.e., compact design having independent control of both temperature and volume of air supplied to the four zones. The JP ‘813 reference and Inoue do not disclose systems having four air-mixing chambers, but rather only two mixing chambers. DE ‘359 does disclose four air-mixing chambers, but is incapable of providing independent control of both the quantity and temperature of four separate zones. Because the air flaps 5 and 6 are in a common space supplying at least two mixing chambers, the volume of air (at least at the same temperature) cannot be independently controlled for the four mixing chambers in the system disclosed in Figs. 4-6. Of course, the design of the system in DE ‘359 (employing two heaters and having a central cold air path) is substantially different from the presently claimed invention, as well as offering none of the advantages.

Applicants do not have an English translation of the DE '359 reference; however, it is not believed that a description of this document is needed beyond the observations noted above. The PTO seems to be approaching this document from the standpoint of requiring Applicants to explain the reasons why a person skilled in the art would not modify the reference to introduce features of the present invention. This is not the correct standard of patentability. A well recognized tenet of patent law is that it is not a question of whether the reference could be modified, but rather whether there is any reason, evident from the prior art, to suggest such a modification. The system of DE '359 is designed differently from the present invention, as explained above, and it is not designed to provide independent control of the volume of air to the four individual air mixing chambers and/or zones. Furthermore, it does not employ louvers as part of its design.

One of the inventors of the DE '359 reference, Hans Kampf, has stated in his accompanying Declaration under Rule 132 that the invention set forth in the present application claims was not obvious to himself and sets forth his opinion that it would not have been obvious to other persons skilled in the art in spite of the existence of his own prior art DE '359 reference in the public domain from 1986 until the priority application of the instant case was filed in 1997. The other principal reference in this case, JP '813, was published in 1983. The Declaration is clearly representative of objective evidence that the presently claimed invention was not, in fact, obvious to persons of ordinary skill in the art at the time that it was made.

The basic combination of JP '813 with either Inoue or Egawa completely leaves open the question of independent control of the volume of air to each of the four zones. In other words, a person skilled in the art would not necessarily be motivated to design the purportedly "obvious" system to have independent air volume control. For example, other prior art that does relate to four zones, e.g., DE '359, is designed such that flaps 5 and 6 control the volume of air to more than one zone.

Thus, the further combination of DE '359 with the other references of the basic combination actually undercuts the basic combination rather than aid it, contrary to the alternative ground of rejection set forth in the Office Action. Even more so, DE '361

suggests a completely different approach to a four-zone system, i.e., one in which a warm air duct and a cold air duct are piped to each separate zone and in which a separate air mixing chamber is provided at the outlets of those pairs of ducts, i.e., the antithesis of a compact system. These references to different kinds of four-zone systems present nothing more than an invitation to invent.

Finally, with respect to claim 1, the third alternative ground of rejection is based on a combination of DE '359 and JP '813. It is apparently the position of the PTO that it would have been obvious to modify the four-zone system of DE '359 with either of the arrangements taught in Figure 2 or 3 of JP '813. However, it is evident from the "Modified Figures" included in the Office Action that the resultant modifications are merely another way to attempt to arrive at the structure of the present invention, based on the logically unsound combinations of references discussed above in connection with the other grounds of rejection, i.e., based on the beforehand knowledge of Applicants' invention.

It is apparent from the Modified Figures that the modifications have virtually nothing left of the DE '359 reference, save for the idea of four zones. It is meaningless to think of "modifying" a reference system by essentially gutting the entire design and mode of operation and replacing it with the innards of another system. This is not how the real world innovates, and it is not an appropriate way of determining the issue of obviousness. Moreover, it would not be equivalent to substitute separate control flaps or louvers for the flaps 5 and 6 in DE '359, since this would change the fundamental design and operation mode of the DE '359 system. Once again, the PTO's consideration leaves out of consideration the claimed feature of independent control of the air volume in each of the four zones.

The rejection of claims 4-6 and 12-14 under Section 103 is believed to be improper for all of the reasons set forth above with regard to the basic combinations of references, as well as additional reasons regarding the further references relied upon in the rejection of these claims, i.e., the Otsuka and Logsdon references. At the outset, it

should be noted that neither of these newly cited references in any way remedies the basic defects in the prior art teachings discussed above.

It is interesting that the PTO must rely upon the doctrine of inherency in connection with the Otsuka reference. There is absolutely no teaching whatsoever in Otsuka regarding the use of angled louvers to provide enhanced mixing of air, let alone in the context of an automotive heating/air-conditioning unit of the basic design recited in the present claims. In fact, Otsuka's fan 10 is downstream of the heater 8 and louver unit 9, and the specification states that "duct fan 10 is adapted to mix the heated and cooled air." (Col. 2, lines 30-31) Thus, first of all, the law is clear that "that which is inherent may not necessarily be obvious." Inherency is the antithesis of "obviousness." Second, the Applicants are not claiming to have invented a new principle of physics, but rather a novel and non-obvious application of many individually known structures and principles to a particular field of endeavor, namely, a four-zone automotive heater/air-conditioner. The prior art simply does not teach any reason or advantage for employing the directed louvers in the manner claimed in claim 12 and others, to produce the highly beneficial result of a four-zone heating/air-conditioning system that is capable of independently controlling the air volume and temperature in each zone. Indeed, JP '813 clearly did not recognize this advantage, i.e., in Figure 3 the louvers 23 appear to direct the warm air away from the cold air stream when opened part way!

Logsdon does not come from the automotive heating/air-conditioning field, but from the field of air handling generally. This reference too is evidence only of the fact that the principle of convergent air streams is known (since at least 1976) to provide more thorough mixing. The reference was selected in hindsight, not because there was any recognition that the application of this principle in an automotive heating/air-conditioning system would provide any particular advantage.

Claims 12-14 and 17 are directed to another preferred aspect of the present invention, the use of louvers and flaps to accomplish a more thorough mixing action that has the added advantage of permitting a still even more space-saving design of the system. While JP '813 discloses the use of louvers, as noted above, it is very evident

from the drawings that no value was recognized in the orientation of those louvers. For example, in Fig. 3 of JP '813, the louvers are shown closing the lower half of the heater in a way that would, when partially open, tend to deflect the warm air in the direction opposite to the cold air. Apparently, the open position of the louvers is taught to be "straight ahead." Thus, the prior art recognizes neither the structure of claim 12 nor the advantages obtained by that structure.

In order to reject claim 12, the PTO requires at least four (4) prior art references in order to support the alleged "obviousness" of the claimed subject matter, with one reference being relied upon for its "inherent" disclosure, and another reference pulled from the non-automotive heating/AC art. This is all evidence of a rejection based on hindsight. Similar comments apply with regard to claim 6.

The PTO's attention is once again directed to the accompanying Rule 132 Declaration of Hans Kampf. In Paragraph 8 of his Declaration, Mr. Kampf sets forth the following relevant opinion and observations with respect to the subject matter of claims 12-14:

It should be recognized that the design of a compact system that permits independent control of air temperature to four separate zones within a vehicle passenger compartment involves the reconciliation of two mutually contradictory considerations, namely, the trade-off between compactness and the ability to achieve thorough mixing (in a necessarily small mixing chamber) of warm and cold air, in order to overcome the problem of non-uniform temperature air streams, as discussed in the paragraph bridging pages 1 and 2 of the above-identified application. According to the preferred embodiment of the invention disclosed in this application and claimed in claims 12-14, not only can the mixing chambers be made more compact by using the louvered warm-air control elements, but with the claimed orientation of the louvers to direct warm-air toward the cold-air, it is possible to obtain an unexpectedly sufficient degree to mixing to overcome the problem of non-uniform air temperature streams exiting from the mixing chambers. Providing this advantage and overcoming the recognized problem in a way not previously taught in the automotive air-conditioning art should also be considered as objective evidence tending to show that the claimed invention would not have been obvious to a person of ordinary skill in the art at the time that the present invention was made.

The PTO must consider the solution of yet another problem in the art (non-uniform temperature layers in the air streams exiting from passenger compartment vents) as part of the “invention as a whole” set forth in claim 12, when conducting its patentability evaluation under Section 103. It is not evident from the record that this further evidence of non-obviousness has been properly considered by the PTO.

Claim 13 recites additional structure not shown in the references and recites the above-discussed independent control of the air volume in each of the four zones, i.e., the feature improperly ignored by the PTO. This claim is clearly allowable for all of the reasons set forth above.

Claim 14 adds to claim 13 additional structure that is likewise not shown in any of the references, and not even in the “modifications” constructed in the Office Action based on the combination of DE ‘359 and JP ‘813. This claim is therefore patentable for still additional reasons over and above claim 13. Similar comments apply with respect to claim 4.

Claim 5 depends from claim 4. See comments above with respect to claims 14 and 4. Additional beneficial effect is produced in Applicants’ novel combination by virtue of the additional structure recited in claim 5, to aid in establishing patentability to the overall combination.

Claims 7, 9 and 11 are patentable for at least the reasons set forth above with respect to their parent claims.

Conclusion

Applicants believe that the “invention as a whole” defined by the claims remaining in the application patentably distinguishes over the prior art and request reconsideration and withdrawal of the rejections raised in the outstanding Office Action. The governing law of the Federal Circuit and the CCPA requires that the determination of obviousness before the PTO and in the courts be based on objective criteria, and in particular, that the patentability determination reflect the “real world” situation, i.e., looking at what persons of ordinary skill in the art did in the real world based on the state of the prior art as

evidenced by the prior art of record. The objective evidence in this record, including the Declaration of Hans Kampf, who is a person of ordinary skill in the art, clearly demonstrates that the novel and very advantageous invention claimed herein was not recognized in this highly competitive field, although the basic teachings of the cited prior art were known for more than a decade before this invention and the advantageous characteristics resulting from this invention were recognized and unsuccessfully sought after equally as long prior to the present invention. This objective evidence represents hallmarks of a patentable invention. Applicants submit that, in light of the evidence of record, the present application is in condition for allowance, and they courteously solicit its allowance.

Respectfully submitted,

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